targets management initiative

Common Digital Architecture

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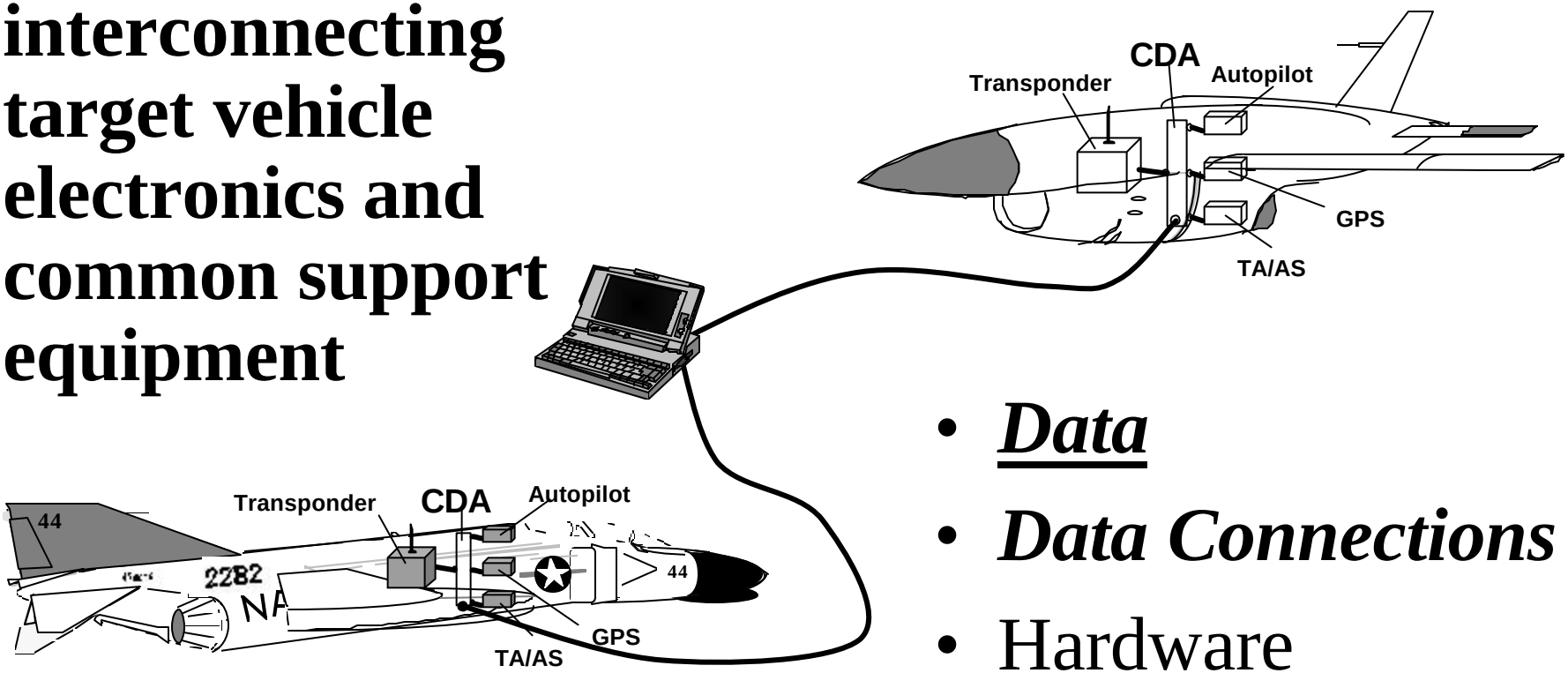
Catch the Wave

Standard for interconnecting target vehicle electronics and common support equipment

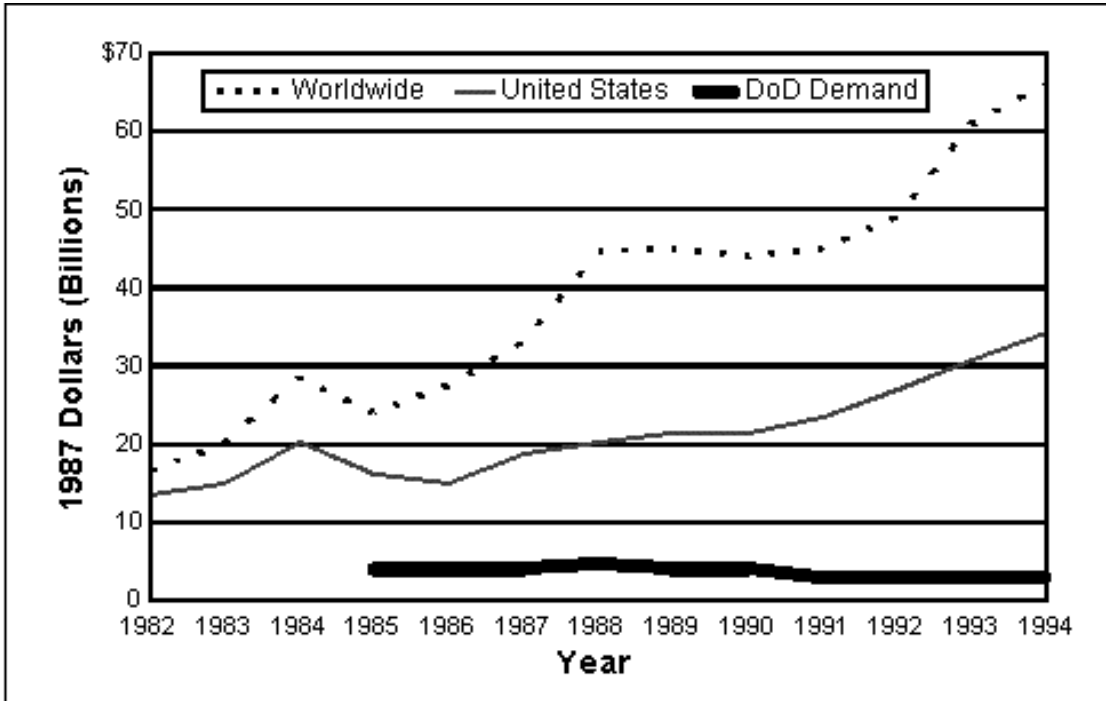


- ***Data***
- ***Data Connections***
- Hardware

benefits

- Smarter Targets and Payloads
  - Maximized platform crossover
- Provide ‘Hooks’ to Reduce Integration Costs
  - Minimized development efforts
  - Cost containment of new developments
  - Facilitate deployment scheduling
- Provide smoother Technology Upgrade paths
  - Plug-n-Play functionality
  - Commonality of Function, Operation, and Data Structure

DoD no longer drives the market

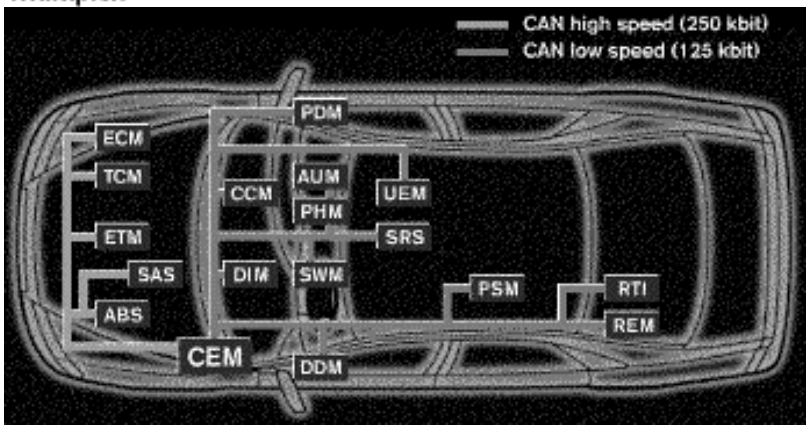


Due to the changes within the defense market segment, as well as the required deployment within our business group, Intel has decided to End Life of their Military and Special Environment products.

what's industry doing?

Multiplex

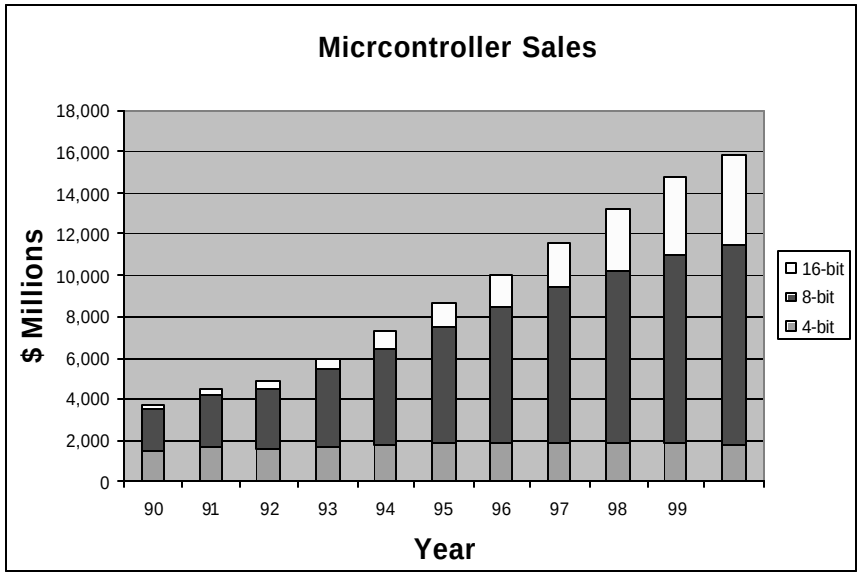
Body Electronics & Security



MUX uses one or more serial networks in order to achieve:

•Reduction of the number of wires within a vehicle
•Increased functionality
•Increased flexibility
•Virtual integration of system functions
•Improved systems diagnostics

- Microcontrollers are going into everything from washing machines to automobiles.
- The volume is driving cost down and capabilities up.
- Inexpensive 'smart' devices are a reality



early years

- **FY 97**
- Workshops
- CDA 101 standard
- Insertion Plan

- **FY 98**
- Seaborne Target Demonstration
- BQM-74 Implementation Report
- MQM-107 Implementation Report
- Gateway Design and AF Report

specification building blocks

Road vehicles -- Interchange of digital information -- Controller Area Network (CAN) for high-speed communication

International Organization for Standardization

NMEA 2000

STANDARD FOR SERIAL-DATA NETWORKING OF MARINE ELECTRONIC DEVICES

CAN KINGDOM

A set of protocol primitives, and a tool for a system designer to create an optimized higher layer protocol.

Target Unique Data Requirements

CDA 101
The Specification

Data

- CDA 101//35 Rotary Wing Target Systems
- CDA 101/34 Full-Scale Aerial Target Systems
- CDA 101/33 Sub-Scale Aerial Target Systems
- CDA 101/32 Ground Vehicle Target Systems
- CDA 101/31 Seaborne Target Systems

[redacted]

- CDA 101/42 Target System Augmentation
- CDA 101/41 Common Controllers, Actuators, and Sensors

NMEA

- CDA 101/12 Parameter Definitions

- CDA 101/11 System Messages

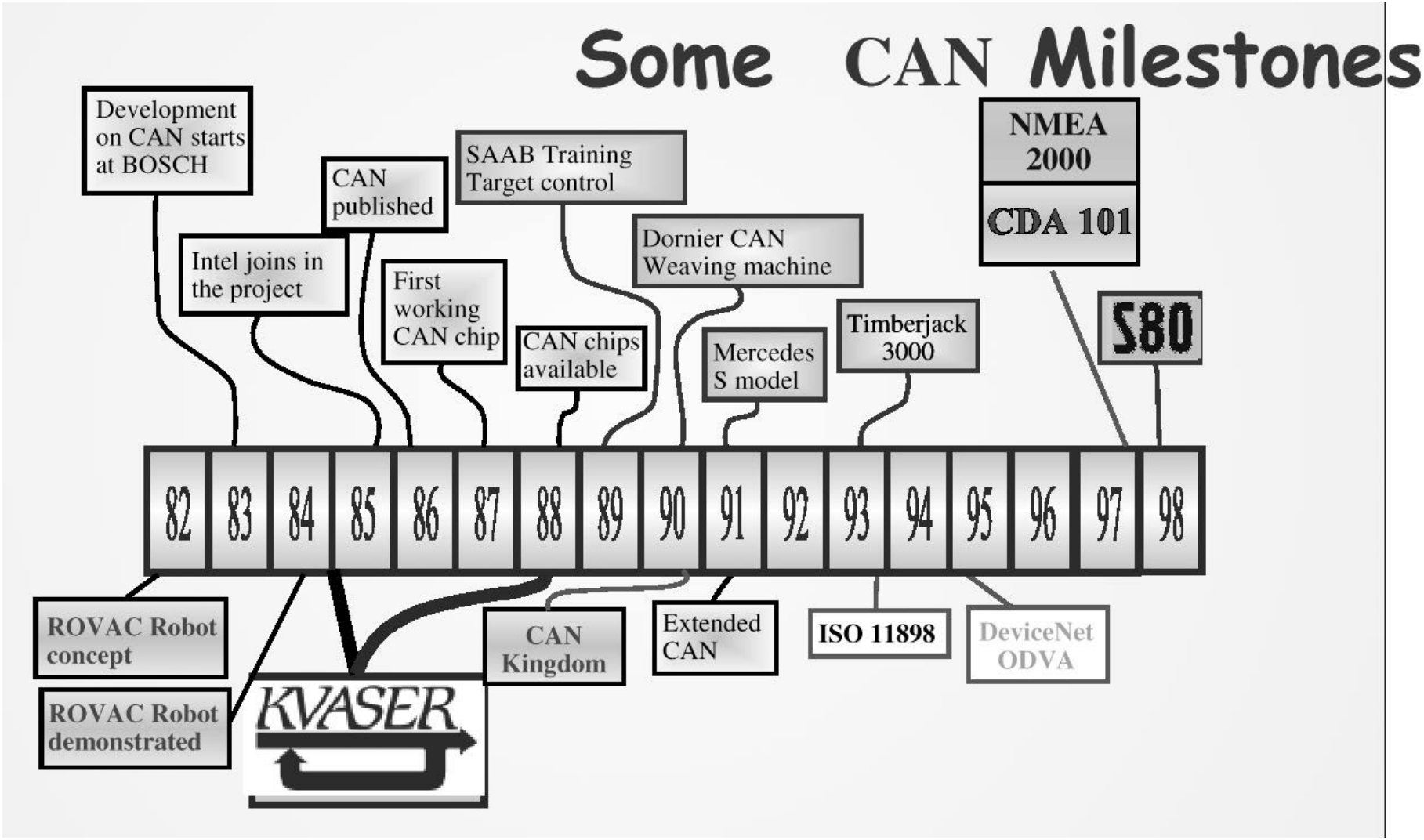
KVASER

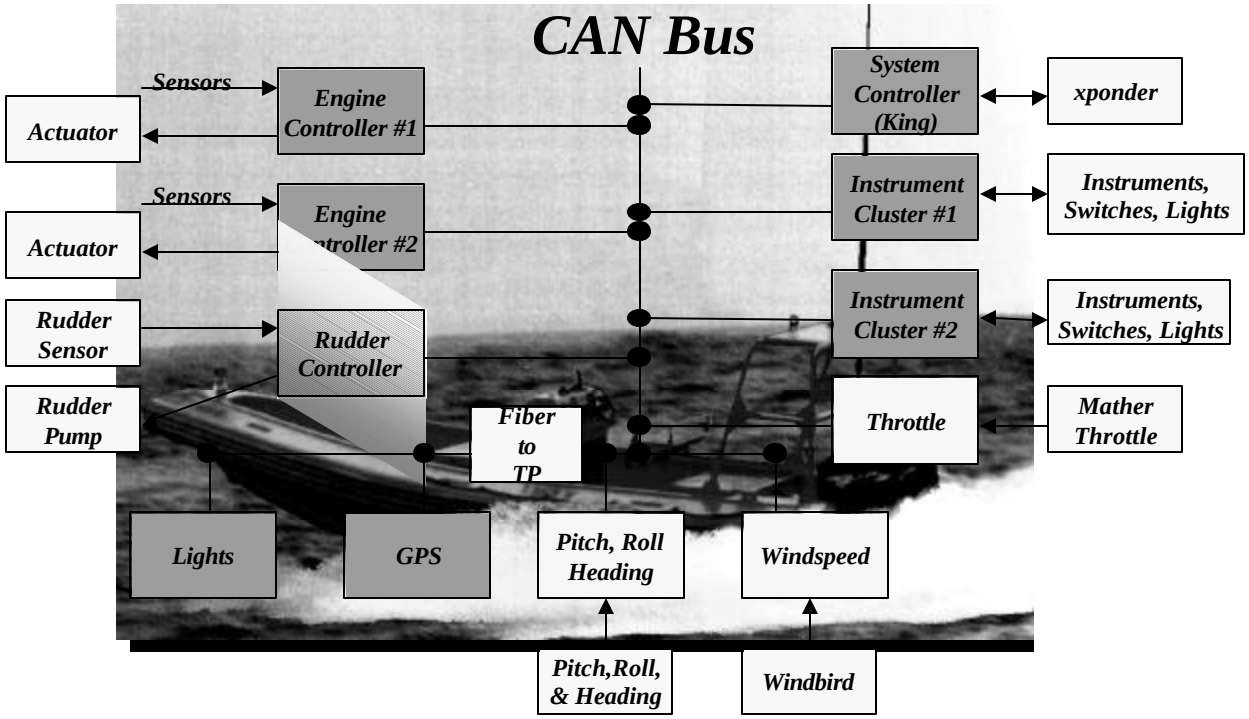
Hardware

ISO

- CDA 101/21 Controller Area Network
- CDA 101/22 MIL-STD-1553 Bridge
- CDA 101/23 UDP/IP Bridge
- CDA 101/24 RS-232/422 Bridge
- CDA 101/25 Radio Frequency Transponder Bridge
- CDA 101/26 Routers

controller area network





CDA 101 Hardware/Software Reference Design

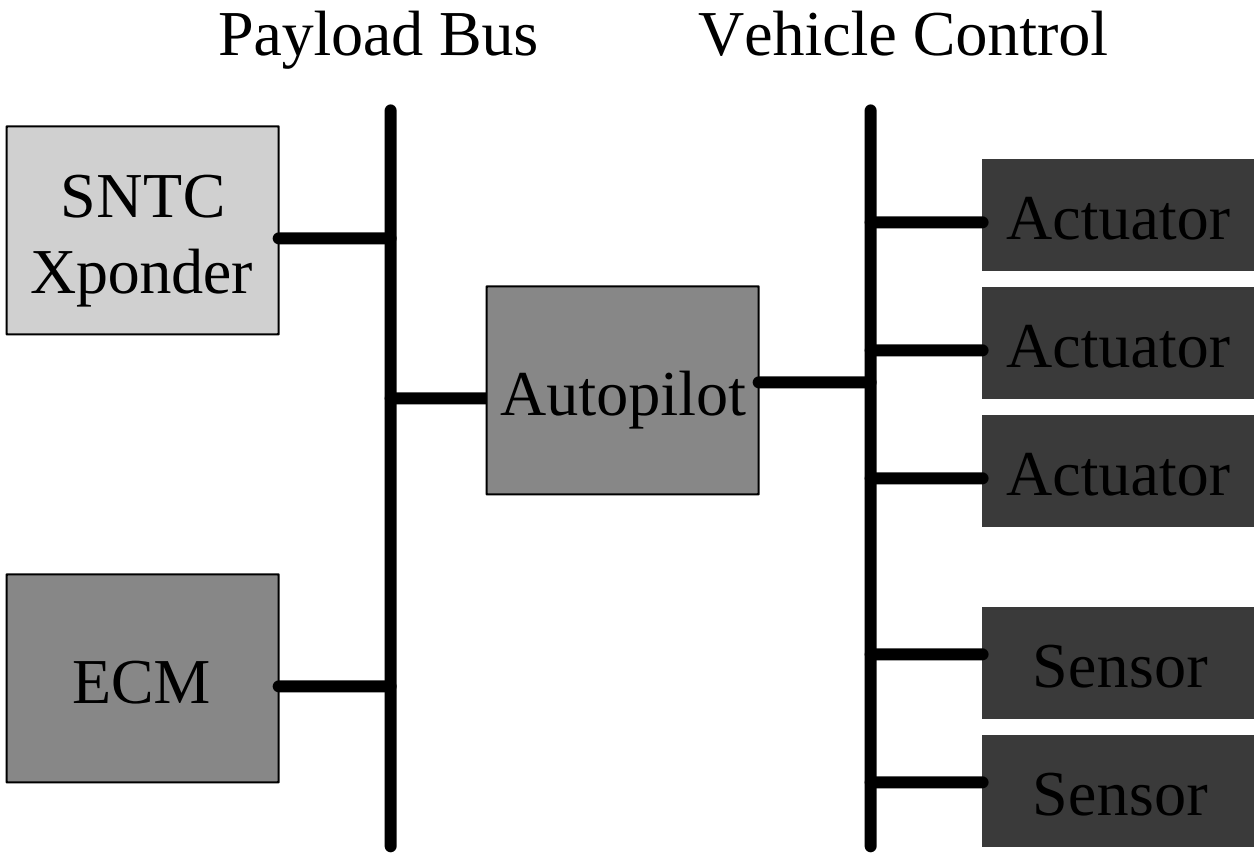
- 25% reduction in electronics cost
- Marked increase in flexibility
- Simplified maintenance & logistics
- Reduction in development time

FY99/00 program overview

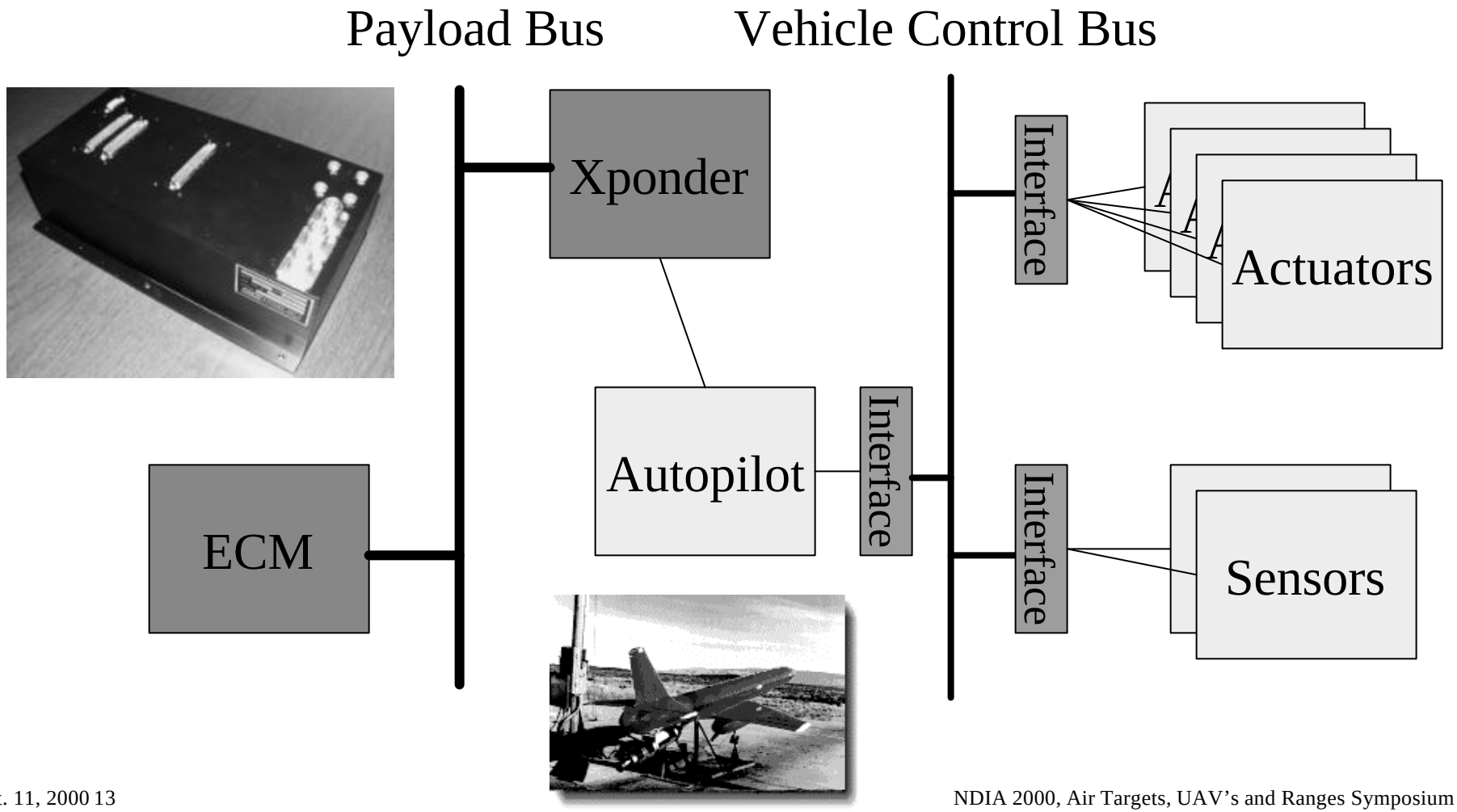
- *Training*
- BQM-74 Implementation
- MQM-107 Implementation
- ECM Implementation
- Ground Target System

- QF-4 Low Cost GPS Evaluation
- Compliance/Evaluation Procedure

Notional Target Diagram



MQM-107

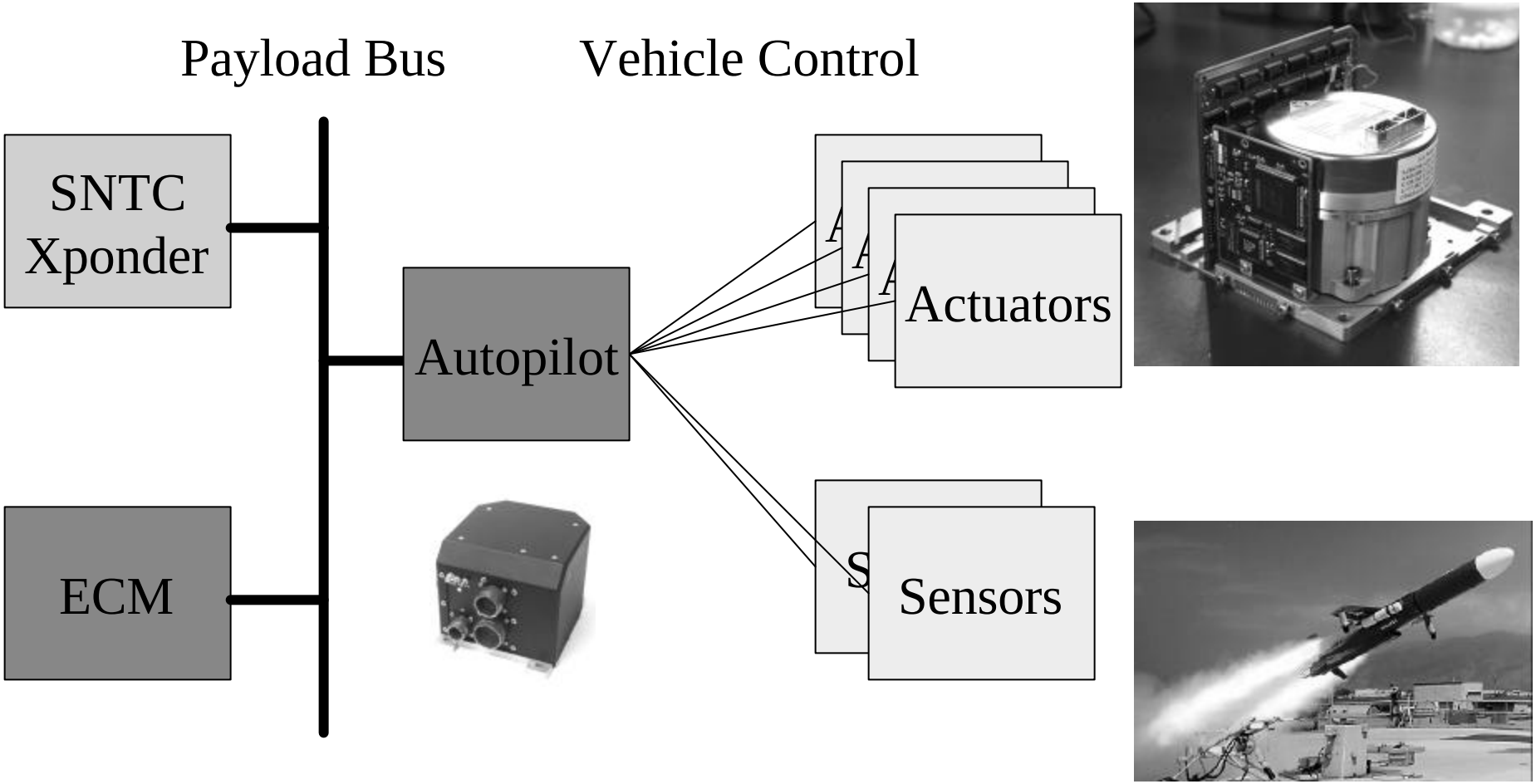

Payload Bus
Vehicle Control Bus
Xponder
Interface
Actuators
Autopilot
Interface
ECM
Interface
Sensors

integration into MQM-107

- FY99
  - Modified SPVI
  - Ground HIL
- FY00
  - Modify ground station
  - Flight nodes
  - Flight Test

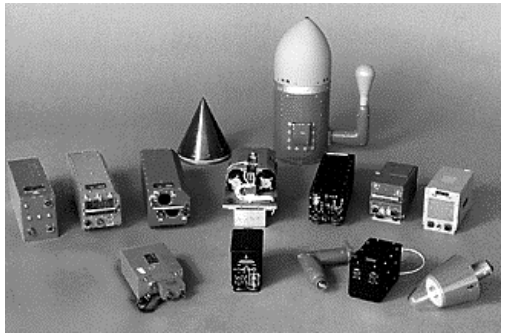
current efforts

BQM-74


Payload Bus
Vehicle Control
SNTC Xponder
ECM
Autopilot
Actuators
Sensors

integration into BQM-74

- FY99
  - Modified IAU
  - Modified ULQ-21
  - Ground Demonstration
- FY00
  - Modify SNTC transponder and ground station
  - Flight Test

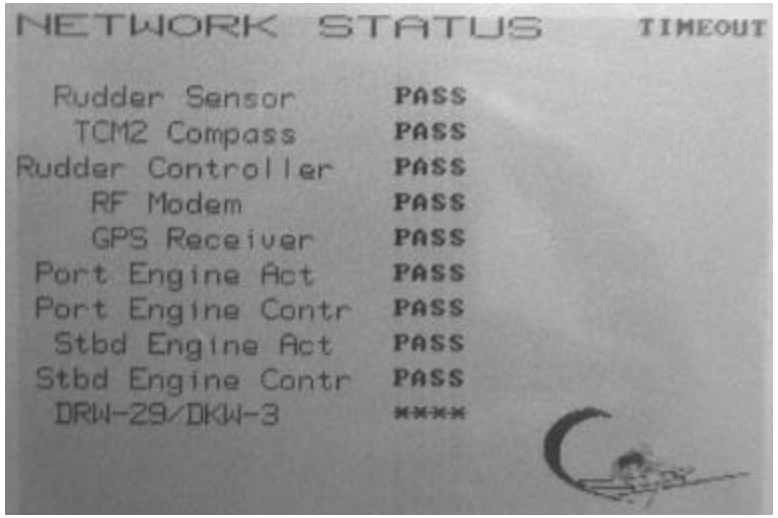


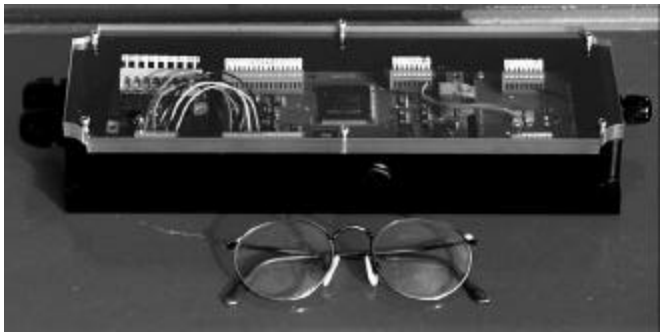
classes/publicity

- **Hands on classes**
- **International targets conference October**
- **NDIA booth 1999**
- **Web site**
  - https://chinook.mugu.navy.mil/

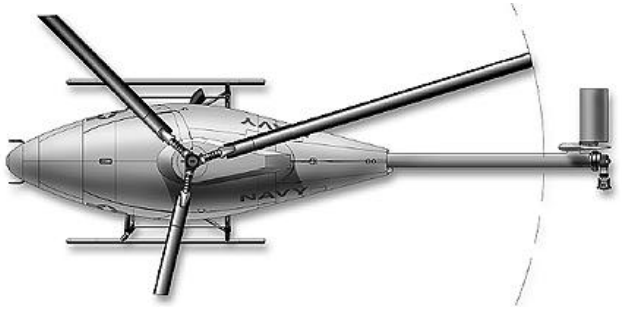
seaborne targets

- HSMST Production FY00
  - Fielding FY01
- Remote control minesweeper
- Follow on QST-35
- Proposal for Australian Navy





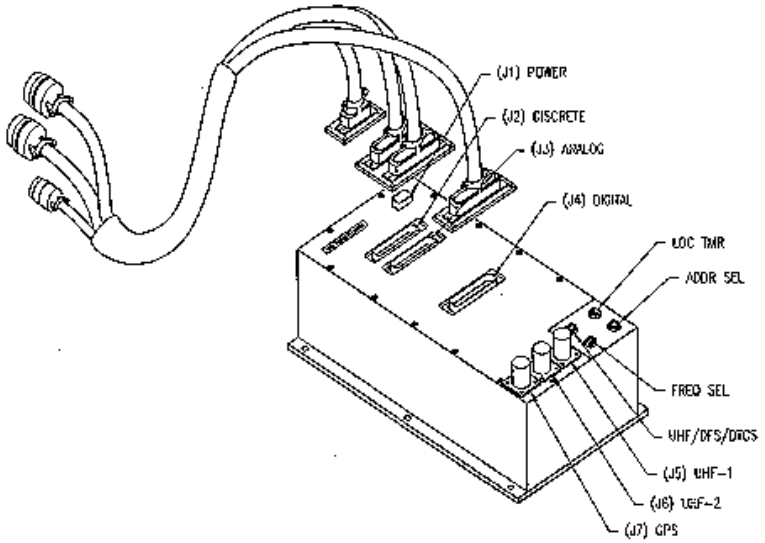
VTUAV



- Northrop-Grumman has proposed using CDA in the VTUAV
  - Held class and on-site briefing for NG
  - Briefing for Avionics IPT

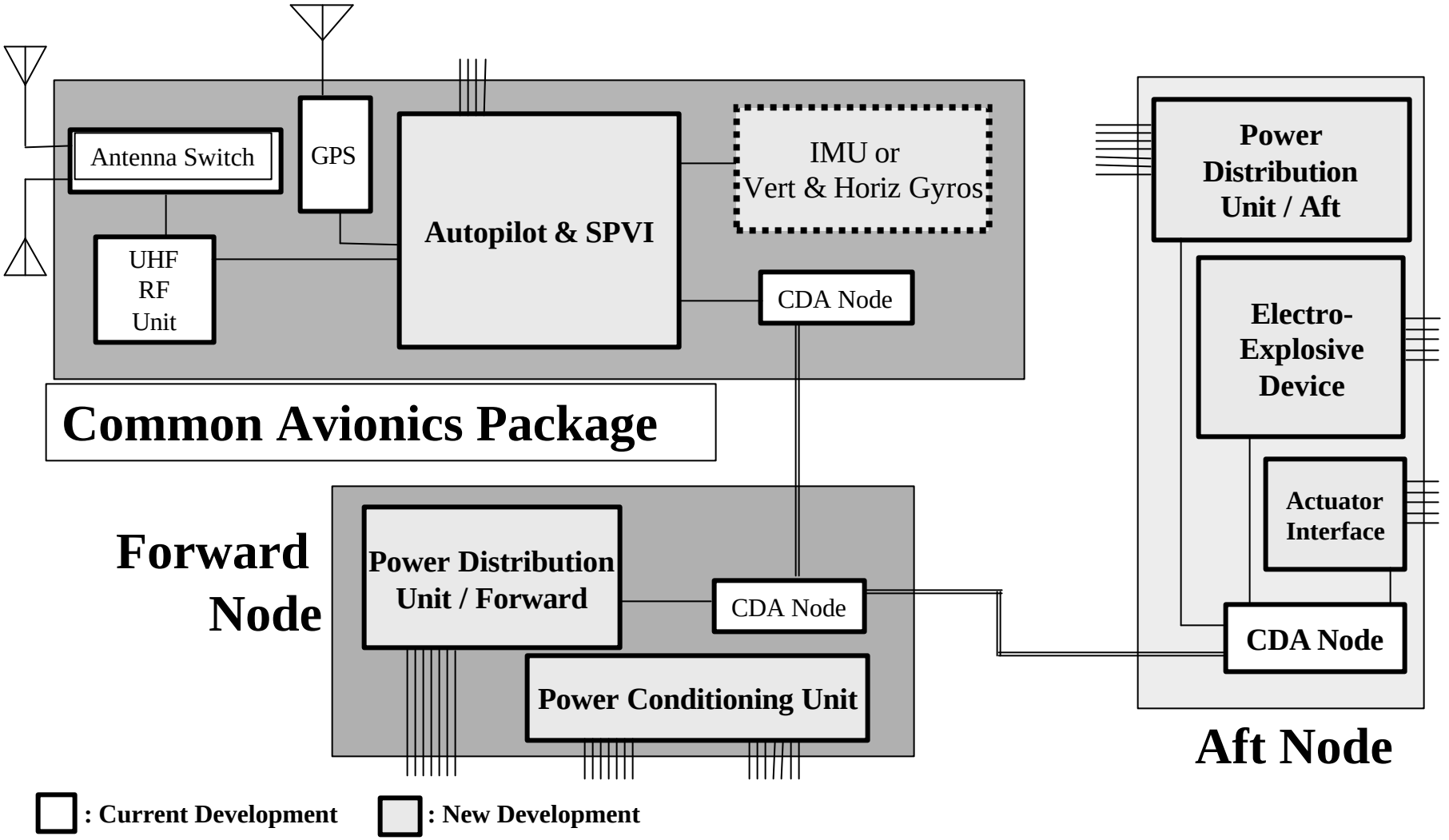
universal signal processor vehicle interface

- **SPVI for QUH-1 Must be Redesigned for New Control System.**
  - **Driven by Y2K Issue**
- **SPVI for MQM-107 Must be Heavily Modified for CDA Program**
- **State-of-the-Art Microcontroller with CANbus Interface Enabled Common Development Effort.**
  - **<u>Significant Cost Savings!</u>**
- **Package height reduced 2"**
  - **Still Maintains Enough Room for the Autopilot.**



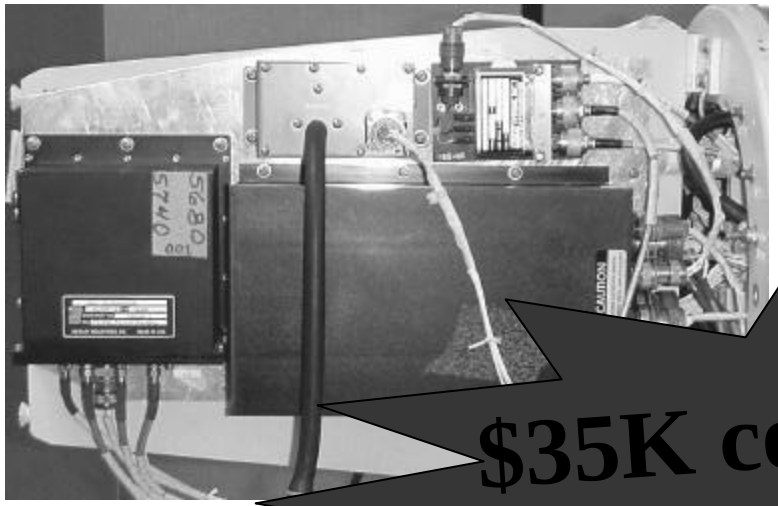
New USPVI will Work With QUH-1, QAH-1, MQM-107, and BQM-74

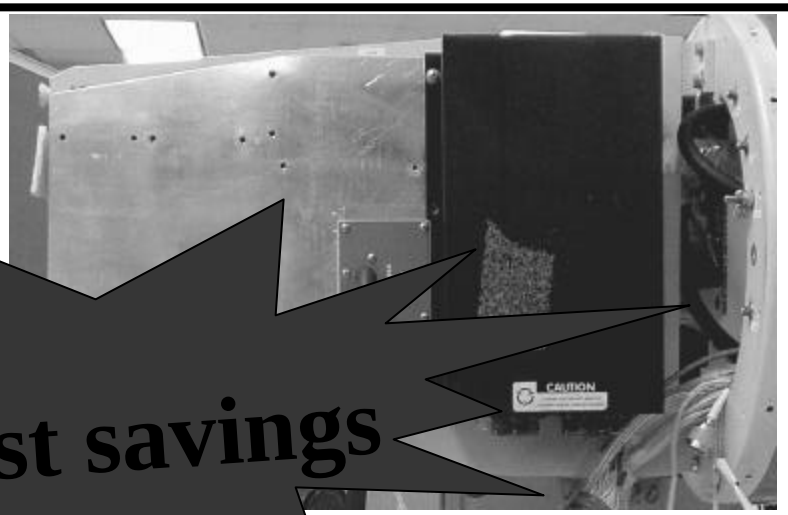
MQM-107 CAP


Antenna Switch
GPS
Autopilot & SPVI
IMU or
Vert & Horiz Gyros
UHF
RF
Unit
CDA Node
Common Avionics Package
Forward
Node
Power Distribution
Unit / Forward
CDA Node
Power Conditioning Unit
Power
Distribution
Unit / Aft
Electro-
Explosive
Device
Actuator
Interface
CDA Node
Aft Node
: Current Development
: New Development

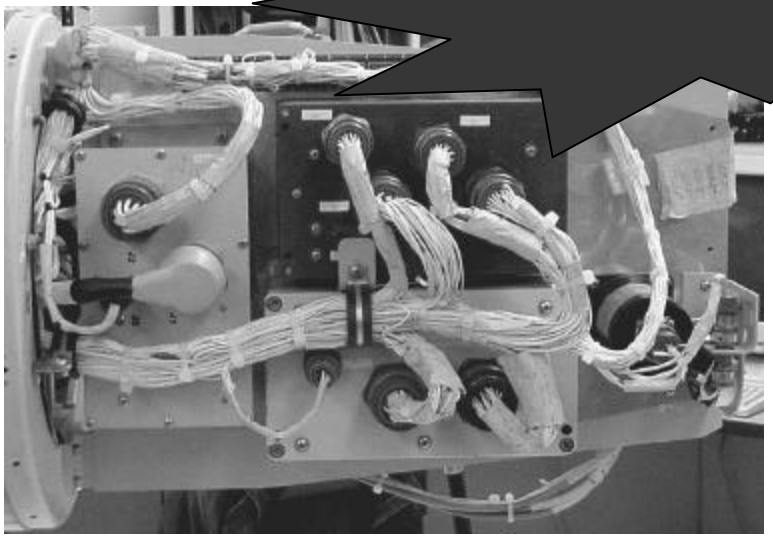
cost savings

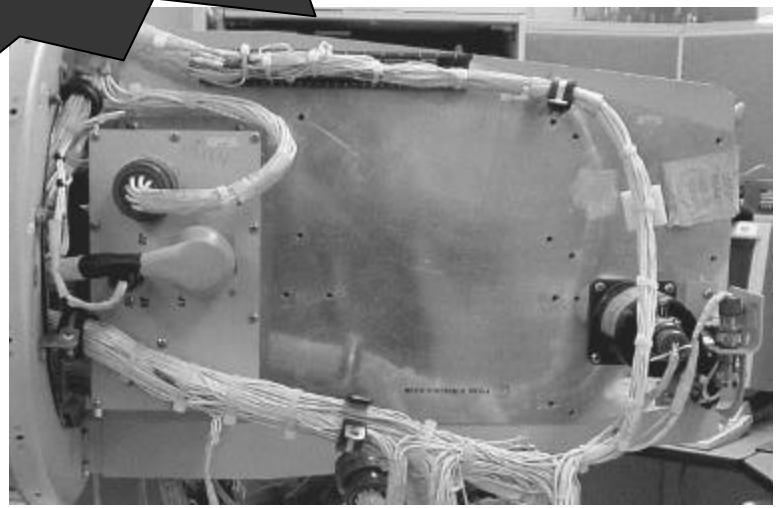
This is your Target without CAP





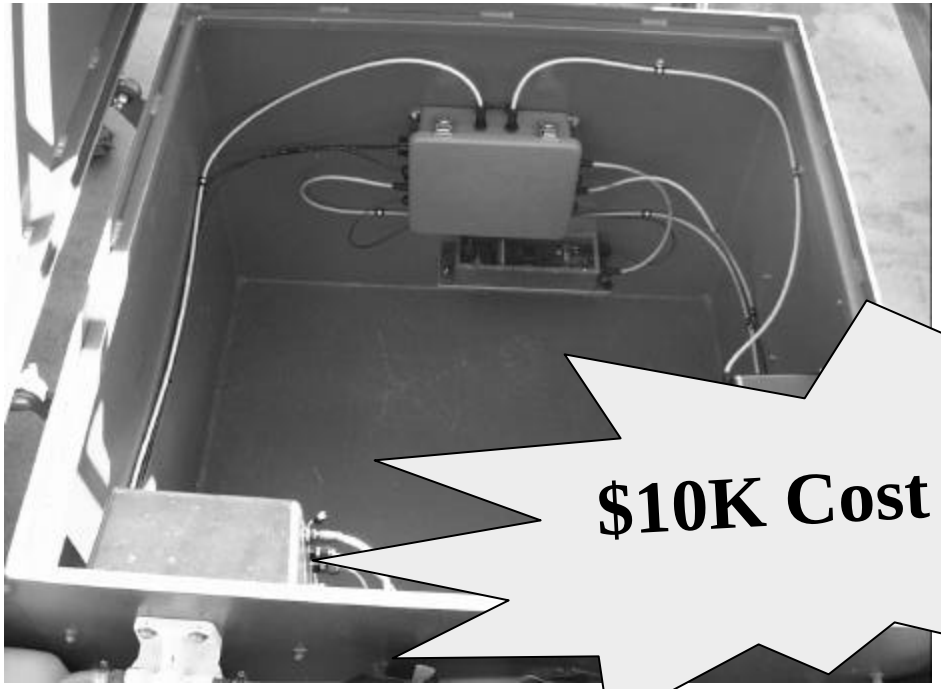
$35K cost savings

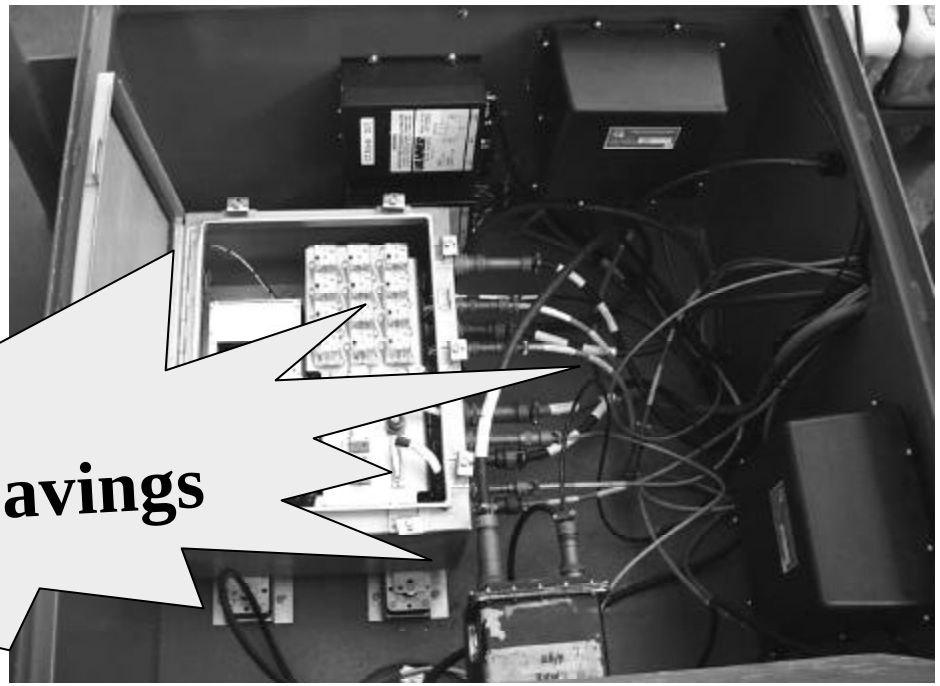




This is your Target with CAP

any questions?





$10K Cost Savings

This is your target with CDA.

This is your target without.